

ECO 202 Principles of Economics II

Lecture 12: Macroeconomics in an Open Economy

Xiaozhou Ding

April 20, 2018

- 1 The Balance of Payments
- 2 The Foreign Exchange Market and Exchange Rates
- 3 The International Sector and National Saving and Investment
- 4 The Effect of a Government Budget Deficit on Investment
- 5 Monetary Policy and Fiscal Policy in an Open Economy

Until now, we have mostly ignored the linkages among countries at the macroeconomic level.

But countries are linked:

- By trade in goods and services
- By flows of financial investment

In this chapter, we will consider how these linkages work, and what the implications are for fiscal and monetary policy.

The Balance of Payments

A country that has interactions in trade or finance with other countries is known as an open economy, as opposed to a closed economy, which has no interactions in trade or finance with other countries.

No economy is completely closed, though a few countries, such as North Korea, have limited foreign economic interactions.

A good way to understand economic interactions with other countries is by examining the balance of payments (BoP).

Definition

Balance of payments: the record of a country's trade with other countries in goods, services, and assets.

- Current account
- Financial account
- Capital account

Balance of Payments

	Current Account	1,633
Exports of goods		-2,374
Imports of goods		
	Balance of trade	-741
Exports of services		711
Imports of services		-477
	Balance of services	234
Income received on investments		823
Income payments on investments		-585
	Net income on investments	238
	Net transfers	-120
	Balance on current account	-389
	Financial Account	
Increase in foreign holdings of assets in the U.S.		1,031
Increase in U.S. holdings of assets in foreign countries		-792
	Balance on financial account	239
	Balance on Capital Account	0
Statistical discrepancy		150
Balance of payments		0

- Current account
The part of the BoP that records a the country's net exports, net income on investments, and net transfers
- Financial account
The part of the BoP that records purchases of assets a country has made abroad and foreign purchases of assets in the country
- Capital account
The part of the BoP that records relatively minor transactions such as migrants' transfers and sales and purchases of nonproduced, nonfinancial assets.

The balance of payments is the sum of these three.

- It must equal zero.
- This money must have been used either to buy U.S. assets or to keep as U.S. currency holdings overseas.

Statistical discrepancy is the difference.

The **current account** records a country's net exports, net income on investments, and net transfers. It is made of up

- Balance of trade
- Balance of services
- Net income on investments
- Net transfers

The most important part of this is the balance of trade, the difference between the value of the goods a country exports and the value of the goods a country imports.

- Positive=trade surplus
- Negative=trade deficit

Balance of services is the the difference between the values of the exports and imports of services. For simplicity, we will frequently ignore the latter two-their sum is close to zero for the U.S.-and think of net exports as being equal to the current account balance.

While the current account records short-term flows of funds into and out of the country, the **financial account**, the part of the BoP that records purchases of assets a country has made abroad and foreign purchases of assets in the country, records **long-term flows**:

- Capital outflows
Purchases of assets overseas by Americans
- Capital inflows
Purchases of American assets by foreigners

These assets might be financial assets, like stocks and bonds-**foreign portfolio investment**-or physical assets, like factories-**foreign direct investment**.

The balance on the financial account can be thought of as a measure of **net capital flows**, or alternatively as its negative, **net foreign investment**, which is the difference between capital outflows from a country and capital inflows.

Prior to 1999, the financial account and the capital account were known collectively as “the capital account.”

Since then, the capital account refers only to relatively minor transactions, like migrants’ transfers or sales and purchases of nonproduced, nonfinancial assets like intellectual property or natural resource rights.

The balance on the capital account is relatively small-\$45 billion in 2014-so we will ignore it.

The Foreign Exchange Market and Exchange Rates

When a firm or consumer wants to buy something—a good, a service, a financial asset—from a foreigner, that foreigner will often want to be paid in their own currency.

Definition

exchange rate: The value of one country's currency in terms of another country's currency

Example

If one U.S. dollar can purchase 100 Japanese yen, then the exchange rate is $¥100 = \$1$, or alternatively, $¥1 = \$0.01$.

We can also calculate the **real** exchange rate, which corrects the nominal exchange rate for differences in prices between countries.

Foreign exchange markets are very active; over \$4 trillion in currency is traded in foreign exchange markets each day.

Currency	Units of Foreign Currency per U.S. Dollar	U.S. Dollars per Unit of Foreign Currency
Canadian dollar	1.31	0.763
Japanese yen	124.32	0.008
Mexican peso	16.37	0.061
British pound	0.64	1.56
Euro	0.9	1.11

The exchange rates in the table are for August 14, 2015.

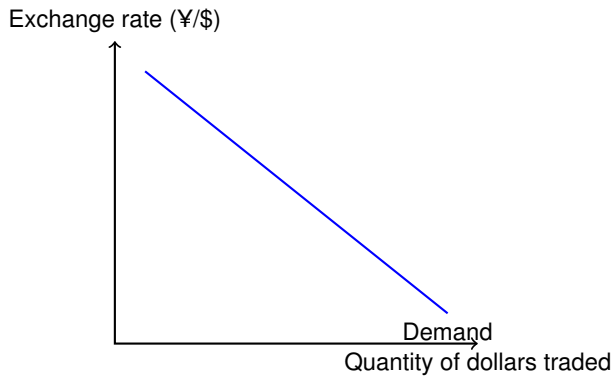
The two versions of the exchange rate are reciprocals of each other; 1.31 Canadian dollars bought 1 U.S. dollar, or equivalently 1 Canadian dollar bought

$$\frac{1}{1.31} \approx 0.763 \text{ U.S. dollars}$$

Market exchange rates are determined by supply and demand, just like any price. The demand for \$US comes from:

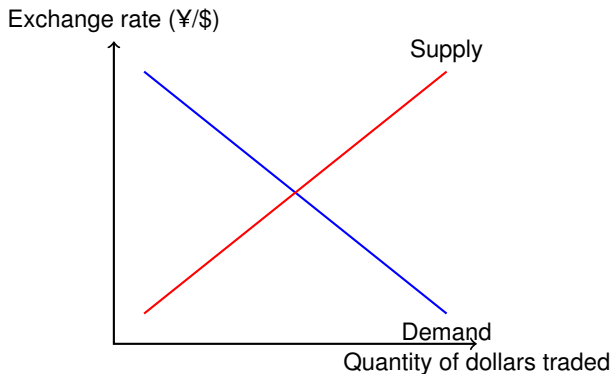
- 1 Foreign firms and households wanting to buy U.S. goods and services
- 2 Foreign firms and households wanting to invest in U.S. physical or financial assets
- 3 Currency traders believing the value of the \$US will rise

Equilibrium in the Foreign Exchange Market



Equilibrium in the Foreign Exchange Market

Unlike in markets for goods and services, the supply of \$US is caused by just the same elements as cause the demand for \$US, only in reverse: firms, households, and speculators wanting to obtain (say) Japanese yen and pay for them with U.S. dollars.



The equilibrium exchange rate is the exchange rate at which the quantity of dollars supplied is just equal to the quantity of dollars demanded.

- If the exchange rate is too high, more people will want to sell \$US for yen than want to buy them—a surplus.
 - The exchange rate will depreciate: the value of the \$US will fall, relative to the value of the yen.
- An exchange rate that is too low will cause the \$US to appreciate: increase in market value relative to the yen (or generally any other currency).

Are All Exchange Rates Determined by the Market?

We assume in this chapter that exchange rates are determined by the market.

But this is not always true. For more than 10 years, the value of the Chinese yuan was fixed by the Chinese government at $\$1=8.28$ yuan.

Fixed exchange rates have important consequences; we will consider them in the next chapter.

Anything (apart from the exchange rate itself) affecting the demand for foreign exchange will shift the demand curve-to the right for an increase in demand, to the left for a decrease.

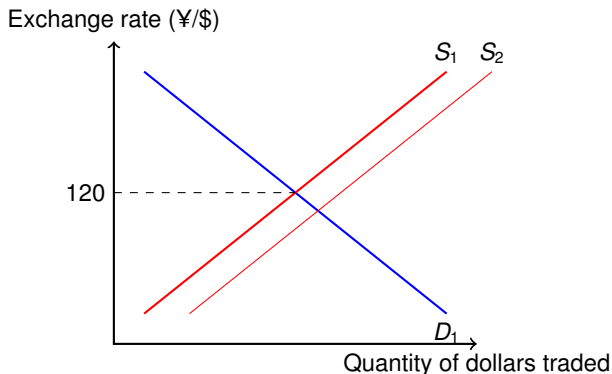
This might result from:

- 1 Changes in the demand for U.S.-produced goods and services relative to foreign produced goods and services
- 2 Changes in the desire to invest in the U.S. relative to foreign countries
- 3 Changes in the expectations of currency traders about the likely future value of \$US relative to foreign currencies

The supply of \$US for yen is the same as the demand for yen with \$US, so the same factors that change demand also change supply.

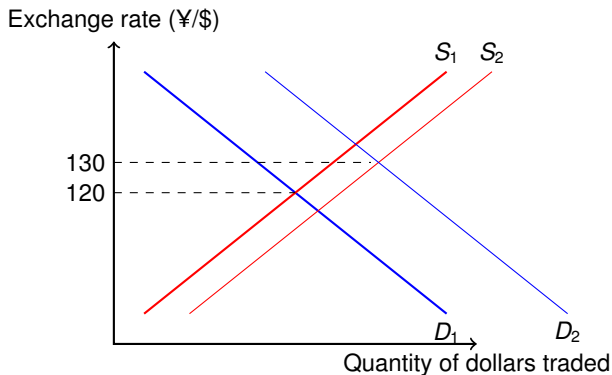
Shifts in the Demand and Supply Curve Resulting in a Higher Exchange Rate

Suppose the exchange rate of yen for \$US starts out at $\text{¥}120 = \$1$. If U.S. incomes rise, increasing our demand for Japanese imports. To pay for the imports, we need to buy yen, hence we supply \$US to the foreign exchange market.



Shifts in the Demand and Supply Curve Resulting in a Higher Exchange Rate

At the same time, if interest rates in the U.S. rise, making U.S. bonds more attractive to hold than Japanese bonds. So the demand for \$US rises.



If the increase in demand is larger than the increase in supply of \$US, the exchange rate will appreciate-to $¥130 = \$1$, in this case.

A large amount of trade in foreign exchange is by speculators, currency traders who buy and sell foreign exchange in an attempt to profit from changes in exchange rates.

Speculators purchase and hold a currency when they believe it will appreciate, or they may engage in more complicated financial transactions.

When the \$US appreciates, the dollar price of foreign imports falls. Similarly, the foreign currency price of U.S. exports rises.

Example

Suppose the exchange rate between \$US and euros is $\$1 = \text{€}1$. An iPhone with a U.S. price of \$200 will cost €200 to a French person. But if the \$US appreciates so that the exchange rate is now $\$1 = \text{€}1.20$, that same iPhone will now cost the French person €240.

Then we expect French people to buy fewer iPhones. But at the same time, French wine has become cheaper for Americans to buy, so we will buy more of it.

An appreciation of the \$US causes U.S. exports to fall and imports to rise, so net exports will fall, hence aggregate demand will fall and also real GDP.

Definition

The real exchange rate is the price of domestic goods in terms of foreign goods:

$$\text{Real exchange rate} = \text{Nominal exchange rate} \times \frac{\text{Domestic price level}}{\text{Foreign price level}}$$

Example

Suppose initially $\$1 = \text{€}1$, and the U.S. and French price levels are both 100. Then the real exchange rate between \$US and euro is:

$$\text{Real exchange rate} = 1 \frac{\text{€}}{\text{\$}} \times \frac{100}{100} = 1 \frac{\text{€}}{\text{\$}}$$

A Change in the Real Exchange Rate

Now suppose the \$US appreciates, so the new exchange rate is \$1 = €1.10, and simultaneously the price level in the U.S. rises to 105 (5 percent inflation) while price levels stay constant in the Euro zone, then:

$$\text{Real exchange rate} = 1.1 \frac{\text{€}}{\text{\$}} \times \frac{105}{100} = 1.15 \frac{\text{€}}{\text{\$}}$$

The interpretation is prices of U.S. goods are now 15 percent higher than they were, relative to the prices of French goods.

Real exchange rates are reported as index numbers, with one year chosen as the base year.

The International Sector and National Saving and Investment

Our main job is to define and apply the saving and investment equation in an international perspective.

When a country's spending exceeds its income, it finances the difference by selling assets or by borrowing. So

$$\text{Current account balance} + \text{Financial account balance} = 0$$

$$\text{Current account balance} = -\text{Financial account balance}$$

That is,

$$\text{Net exports} = \text{Net foreign investment}$$

When U.S. net exports are negative, U.S. net foreign investment is negative by the same amount. China exports more than it imports, so each year, their net foreign investments must be positive and of the same amount.

Saving in an economy can be expressed as:

National saving = Private saving + Public saving

$$S = S_p + S_g$$

with

$$S_p = Y - T - C$$

and

$$S_g = T - G$$

if assuming no transfer payments.

So

$$S = (Y - T - C) + (T - G).$$

But

$$Y = C + I + G + NX,$$

so

$$S = (C + I + G + NX - T - C) + (T - G)$$

$$S = I + NX$$

$$S = I + NX$$

And since net exports equals net foreign investment,

$$\text{National saving} = \text{Investment} + \text{Net foreign investment}$$

We still have the saving must equal investment equation: an equation that shows that national saving is equal to domestic investment plus net foreign investment.

National saving = Investment + Net foreign investment

Example

If you save \$1,000 and use it to buy a bond issued by General Motors, GM might use the \$1,000 to help build a domestic factory (I), or build a factory in China (NFI).

A useful way to rewrite this identity is as:

$$S - I = NFI$$

This highlights the fact that if net foreign investment (i.e. net exports) is negative, then domestic savings must be less than domestic investment.

The Effect of a Government Budget Deficit on Investment

The Effect of a Government Budget Deficit on Investment

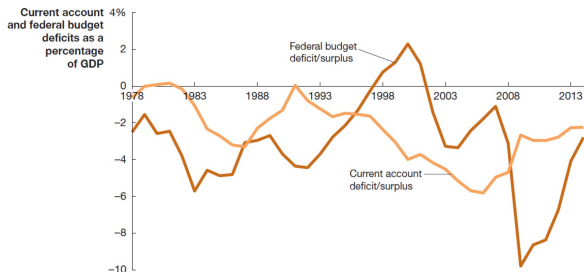
Since we introduced the saving investment equation, one component is related to government savings (S_g). We want to understand the effects of a government budget deficit on investment in an open economy.

When the government runs a budget deficit, S_g public is negative, and national savings tend to decline.

By the saving and investment equation, we know domestic investment and/or net foreign investment must decline.

- Why? When the government runs a budget deficit, it finances its dissaving by selling bonds. To attract buyers, the government must typically raise interest rates.
- Higher interest rates discourage firms from making investments.
- They encourage funds to flow to the U.S. to buy those bonds, causing the \$US to appreciate, but this causes net exports to fall. And net exports equal net foreign investment.

The Twin Deficits

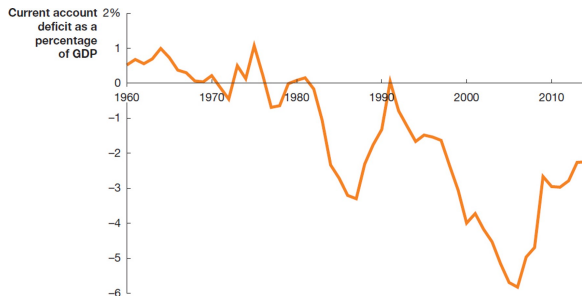


When government budget deficits lead to declines in net exports, the situation is known as twin deficits.

This was a big concern in the early 1980s: large federal budget deficits resulted in high interest rates; high \$US exchange rates and large current account deficits followed.

Since 1990, the budget deficit and current account deficit do not seem to be strongly related; evidence from other countries is mixed.

Why is the U.S. Called the “World’s Largest Debtor”?



The graph shows the current account balance in the U.S. from 1960-2014.

By the end of 2014, foreign investors owned about \$7 trillion more of U.S. assets—stocks, bonds, factories, etc.—than U.S. investors owned of foreign assets. This seems alarming, but:

- It is a vote of confidence in the U.S. economy, and
- The funds have been critical in financing investment and hence growth in the U.S. despite low personal savings rates.

Monetary Policy and Fiscal Policy in an Open Economy

Is monetary policy more effective in an open economy or in a closed economy?

- Expansionary monetary policy effectively means lowering interest rates.
- In a closed economy, this encourages investment, and consumption spending on durables.
- In an open economy, the demand for \$US falls, decreasing the exchange rate, but this causes net exports to rise.

Therefore through this additional policy channel, the expansionary monetary policy will increase aggregate demand by more in an open economy than in a closed economy.

Of course, the same is true of contractionary monetary policy. Monetary policy is more effective in an open economy.

Is fiscal policy also more effective in an open economy?

To find out, we can explore the effect of expansionary fiscal policy on the additional policy channel, net exports:

- Tax cuts or increased government spending increase aggregate demand.
- But this might result in higher interest rates, crowding out net exports due to the appreciating \$US.

Also, the multiplier effect is lower, since some spending takes place on imported goods, which do not feed back in to real GDP. Overall, fiscal policy is less effective in an open economy than in a closed economy.